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/s/

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DATE: February 22, 2002

SUBJECT: APPLICABILITY OF STATE BOARD RESOLUTION 92-49 IN SETTING SEDIMENT CLEANUP LEVELS

I.
QUESTIONS PRESENTED

You have asked the following questions with respect to State Water Resources Control Board (State Board) Resolution 92-49:

A. Does State Board Resolution 92-49 apply to setting cleanup levels for bay bottom contaminated sediments? If so, does the Resolution require cleanup to background sediment concentrations, or just background water column concentrations?

B. If Resolution 92-49 does apply, what are the limitations, if any, to its application? What discretion does a regional board have in designating cleanup levels for sediments less stringent than background conditions?

II.
BRIEF RESPONSE

A. A regional board must apply Resolution 92-49 when setting cleanup levels for contaminated sediments if such sediments threaten beneficial uses of the waters of the

state, and the contamination or pollution is the result of a discharge of waste.[1] Contaminated sediments must be cleaned up to background sediment quality unless it would be technologically or economically infeasible to do so.

B. Resolution 92-49 is flexible and permits a regional board to set alternative cleanup levels less stringent than background concentrations if attainment of background concentrations is infeasible. Any such alternative cleanup level may not unreasonably affect beneficial uses and must comply with all applicable Water Quality Control Plans and Policies. The Resolution allows for consideration of adverse impacts of any cleanup itself as well as natural attenuation if cleanup goals can be met in a reasonable time.

III.
BACKGROUND

The San Diego Regional Board (Regional Board) is currently involved in determining remediation strategies and cleanup levels at various sites within San Diego Bay. Environmental interest groups appearing before the Regional Board have taken the position that under Resolution 92-49, the Regional Board must require cleanup of contaminated sediments to attain background sediment chemistry levels as defined by an off-site reference station. Dischargers argue that Resolution 92-49 applies to water quality and not sediment quality and that attainment of background water quality conditions may not require restoration of background sediment quality conditions. Presumably, in this context, the dischargers interpret the term "water quality" to refer to the concentrations of dissolved or suspended wastes in water associated with contaminated sediment; e.g., in the water column or sediment pore water (the water between particles that make up the bottom sediment).

IV.
DISCUSSION

A. Technical Issues

State Board Division of Water Quality (DWQ) staff have indicated that (1) in most cases the exposure route leading to sediment related toxicity is unknown; and (2) in addition to direct contact with, or ingestion of, water containing dissolved or suspended wastes, routes of exposure that lead to toxic effects can include sediment ingestion and direct contact with contaminated sediment particles. The DWQ assessment is supported by the U.S. Environmental Protection Agency (EPA) which has noted that pore water exposures underestimate the toxicity of sediment bound pollutants that are minimally

[1] As used in this memorandum, the term "contaminated sediments" is intended to refer to sediments that either meet the definition of "contamination" under Water Code 13050(k) or that create, or threaten to create, a condition of "pollution" under section 13050 (l).

soluble in water.[2] EPA has also recognized that sediment ingestion is an exposure route. [3]

B. Legal Issues

1. Porter-Cologne Jurisdiction

The Porter-Cologne Act is replete with provisions intended to protect beneficial uses from impacts from contaminated sediment. As discussed below, Porter-Cologne jurisdiction extends beyond water column effects to require the reasonable protection of beneficial uses from discharges of waste to waters of the state.

2. Water Code Section 13304

Water Code Section 13304 requires a person to clean up waste or abate the effects of the waste if so ordered by a regional board in the following circumstances: if there has been a discharge in violation of waste discharge requirements, or if a person has caused or permitted waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates or threatens to create a condition of pollution or nuisance. "Pollution" is defined as "an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects . . . the waters for beneficial uses . . . ."[4]

The legislative history of the Porter-Cologne Act states in commentary on the definition of "pollution" that "it is the unreasonable effect upon beneficial uses of water, caused by waste, that constitutes pollution."[5] This history expresses the intent that if a person discharges waste into waters of the state and beneficial uses of the water are thereby harmed - then pollution exists even if water column concentrations are not effected by wastes that have settled in sediment.

Settled wastes associated with sediments are some of the most harmful to beneficial uses of waters; e.g., PCBs, pesticides and mercury. If regional board authority under section 13304 were limited to effects on the water column, a regional board could not require cleanup if a discharger dumped into a bay pure PCBs, which due to their insolubility, sunk to the bottom and adsorbed onto sediment particles - resulting in lethal effects to aquatic organisms ingesting or otherwise contacting these sediments.

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[2] See EPA's Contaminated Sediment Management Strategy, pp. 21 and 75, EPA-823-R-98-001, April 1998.

[3] See "The Particle Size Distribution of Toxicity in Metal-Contaminated Sediments, http://es.epa.gov/ncerqa_abstracts/grants/98/envchem/ranville.html.

[4] Water Code section 13050(l).

[5] Final Report of the Study Panel to the California State Water Resources Control Board, 1969, p. 30.

This is inconsistent with the remedial goals of the Porter-Cologne Act to protect beneficial uses of the waters of the state.

State Board Resolution 92-49 describes the policies and procedures that apply to the cleanup and abatement of all types of discharges subject to Water Code Section 13304. These include discharges, or threatened discharges, to surface and groundwater. The Resolution requires dischargers to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality or the best water quality that is reasonable if background levels of water quality cannot be restored, considering economic and other factors. In approving any alternative cleanup levels less stringent than background, regional boards must apply section 2550.4 of Title 23 of the California Code of Regulations.[6] Section 2550.4 provides that a regional board can only approve cleanup levels less stringent than background if the regional board finds that it is technologically or economically infeasible to achieve background. Resolution 92-49 further requires that any alternative cleanup level shall: (1) be consistent with maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial uses of such water; and (3) not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.[7]

3. *Water Code Section 13307*

Water Code section 13307, the statutory mandate that led to the adoption of Resolution 92-49, directed the State Board to establish a policy for the investigation and cleanup of discharges of hazardous substances that create or threaten to create a condition of contamination, pollution, or nuisance. "Contamination" is defined as a condition that creates a public health hazard resulting from the disposal of waste, whether or not waters of the state are affected.[8] As noted above, the State Board, consistent with legislative history, has exercised discretion to interpret the term "pollution" broadly to cover effects beyond the water column to protect beneficial uses of waters of the state from discharges of waste. However, given the expansive statutory definition of "contamination" as applying to disposal sites that pose a hazard to the public whether or not waters are affected, no discretionary interpretation is needed to reach the conclusion that Resolution 92-49 applies to more than the water column. Given the bioaccumulation risk posed by many contaminants in sediment, section 13307 requires regional boards to apply Resolution 92-49 in a way that ensures, at a minimum, that any sediment cleanup is protective of public health – whether or not water column concentrations are

[6] Resolution 92-49, Section III.G.

[7] *Id.*

[8] Water Code section 13050(k).

elevated above background concentrations as a result of contact with contaminated sediments.

4. *State Policy for Water Quality Control*

Statutory requirements for state water quality control policy are set forth in section 13142 of the Water Code. The section provides that such policy shall consist of any or all of: (1) water quality principles and guidelines; (2) water quality objectives; and (3) other principles and guidelines deemed essential by the State Board. This broad discretion suggests legislative intent to protect beneficial uses from more than water column effects when a waste discharge threatens such uses. This principle is reflected in the State Board Policy for Implementation of Toxics Standards and the rescinded Enclosed Bays and Estuaries Plan, discussed below, which apply specifically to sediments. With respect to the coastal marine environment, Water Code section 13142.5 provides that wastewater discharges shall be controlled to protect beneficial uses.

5. *Toxic Hot Spots Legislation*

In 1989, the Legislature added Chapter 5.6 to Division 7 of the Water Code.[9] Chapter 5.6 requires the State Board and regional boards to plan for the cleanup of "toxic hot spots." "Toxic hot spots" are defined as "locations in enclosed bays [and other waters] the pollution or contamination of which affects the interests of the state, and where hazardous substances have accumulated in the water or sediment to levels which . . . may adversely affect the beneficial uses of the bay [or other waters] . . . or (3) exceeds adopted water quality or sediment quality objectives."[10] Section 13390 expresses the legislative intent: "It is the intent of the Legislature that the state board and the regional boards establish programs that provide maximum protection for existing and future beneficial uses of bay and estuarine waters." (Emphasis added.)

Water Code section 13393 requires the State Board to adopt sediment quality objectives using the procedures that apply to the adoption of Water Quality Control Plans. Although the Legislature drew a distinction between water quality objectives and sediment objectives in section 13391.5(e), it appears to have been to clarified that the State Board must set objectives that specifically apply to this part of the aquatic environment over which the State Board has jurisdiction, and which had not received the same degree of attention as the more traditional numeric water column objectives found in Water Quality Control Plans. This interpretation is consistent with Water Code section 13181 and the EPA view, discussed below, that sediment criteria are a

[9] Water Code section 13390 et seq.

[10] Water Code section 13391.5(e).

subset of water quality criteria. Once the sediment objectives are adopted, any sediment cleanup would have to ensure that these objectives are met.
The State Board's Consolidated Toxic Hot Spots Cleanup Plan (Hot Spots Plan) directs the regional boards to implement Resolution 92-49 when implementing the remedial portions of the Hot Spots Plan.[11] The focus of the Hot Spots Plan is on sediment remediation; it provides that: "[c]andidate and known toxic hot spots are locations (sites *in* waters of the State) in enclosed bays, estuaries or the ocean."[12] (Emphasis added.) The State Board intended the term "waters of the state" to be interpreted broadly to include contaminated sediments in these waters. For any dredging project involving contaminated sediments, section 13396(b) prohibits the discharge of dredge spoils in any location "that may cause significant adverse effects to aquatic life, fish, shellfish, or wildlife or may harm the beneficial uses of the receiving waters." There is no condition that the prohibition only applies to harm related to water column effects.

The clear message of the Toxic Hot Spots legislation is that the State Board and regional boards must develop a plan for the cleanup of "toxic hot spots" most of which involve contaminated sediments. The fact that the Legislature did not provide any additional sources of authority to the State Board or regional boards that would allow them to require cleanup of such sites suggests that it viewed the boards' existing powers as broad enough to require cleanup when beneficial uses of the state's waters are threatened by a discharge of waste.

6. *Water Code Section 13181*

Water Code section 13181 directs the State Board to propose a program that includes methods for determining the sources of pollution in coastal watersheds, bays, estuaries, and coastal waters. The proposed program must include methods for determining the degree of improvement or degradation in coastal water quality over time with respect to water quality objectives, sediment quality guidelines, tissue contaminant burden guidelines and health standards. This indicates legislative intent that water quality includes sediment quality.

7. *Judicial Opinions*

The courts have concluded that provisions determining the scope of a regulatory statute must be broadly construed to accomplish the purposes of the statute.[13] The Court of Appeals in *Lake Madrone Water District* v. *State Water Resources Control Board* indicated its support for the proposition that Porter-Cologne jurisdiction extends beyond water column effects by citing with approval an Attorney General opinion on

[11] Hot Spots Plan, p. 6.

[12] *Id.* at p. 12.

[13] *Harvey v. Davis* (1968) 69 Cal.2d 362, 370-71 (1968).

this point.[14] In Opinion No. 55-237, the Attorney General concluded that a discharge of fine-grained materials constituted pollution where the only harm to beneficial uses occurred when these materials settled out on the bottom of a reservoir. The reservoir was used to recharge groundwater and the fine-grained materials sealed the porous surface of the bottom of the reservoir thereby interfering with groundwater recharge. The Attorney General reasoned that a causal relationship existed between the discharge and the impairment even though the immediate cause of the reduction in recharge was the change in the quality of the absorbing surface on the bottom of the reservoir. Applying this same reasoning, the Attorney General also concluded that water was polluted where spawning beds were covered by these same materials - even where there was no effect on the water column.

8. *State Board Policies and Orders*

The State Board has consistently interpreted its jurisdiction as extending beyond the water column where beneficial uses are affected by a discharge of waste. The Enclosed Bays and Estuaries Plan, 91-13 WQ (EBE Plan) (which was rescinded on grounds unrelated to sediment issues), contained the following objectives under the heading "Narrative Water Quality Objectives:" "(1) the concentrations of toxic pollutants in the water column, sediments, or biota shall not adversely affect beneficial uses. (2) Enclosed bays and estuarine communities and populations, including vertebrate, invertebrate, and plant species, shall not be degraded as the result of the discharge of waste." Either of these objectives would be violated if a benthic organism were harmed as a result of the direct contact with, or ingestion of, pollutants in sediment, even if water column or sediment pore water pollutant concentrations were zero. In Order WQ 92-09, the State Board noted that although the EBE Plan did not establish numeric objectives for sediment, Resolution 92-49 required cleanup levels low enough to ensure that these narrative sediment objectives would not be violated.[15]

9. *The Clean Water Act*

EPA is in the process of adopting federal sediment criteria under the authority of Clean Water Act section 304(a), which directs EPA to develop "criteria for *water quality* . . .on the kind and extent of . . . effects . . . which may be expected from the presence of pollutants in any body of water."[16] In 1997, EPA submitted a report to Congress entitled "The Incidence and Severity of Sediment Contamination in Surface Waters of the United States." Section 304 and the EPA report suggest that EPA views sediment criteria as water quality criteria, and that the agency considers contaminated sediments to be contained *in* surface waters to the same degree as a dissolved or

[14] 209 Cal.App. 3d 163, 169 (1989).

[15] Petition of Environmental Health Coalition and Eugene J. Sprofera, September 17, 1992.

[16] EPA's Contaminated Sediment Management Strategy, pp. 21 and 75.

suspended pollutant. Thus, it is clear that EPA would favor an interpretation of the Water Code that is consistent with the Clean Water Act by including the power to regulate more than the water column where necessary to protect beneficial uses of waters of the state from the effects of waste. EPA has indicated that it will publish numeric sediment quality criteria, as guidance, with the intent that states will use the criteria in interpreting existing narrative toxicity water quality criteria. EPA also has noted that states could adopt these federal sediment criteria as state water quality standards.[17]

The Clean Water Act, defines pollution to include "alteration of the chemical, physical, biological, and radiological integrity of water."[18] This definition is analogous to the Porter-Cologne definition, in that pollution is defined to include a change in water. Responding to an attempt by the Federal Energy Regulatory Commission to restrict state authority narrowly to water chemistry issues, and to deny states broader authority over water quality, EPA observed:

> "[P]rotection of water quality involves far more than just addressing water chemistry. Rather, protection of water quality includes protection of the multiple elements which together make up aquatic systems including the aquatic life, wildlife, wetlands, and other aquatic habitat, vegetation, and hydrology required to maintain the aquatic system. Relevant water quality issues include the toxicity and bioaccumulation of pollutants, the diversity and composition of the aquatic species, entrapment of pollutants in sediment, stormwater and non-point source impacts, habitat loss, and hydrological changes."[19]

The United States Supreme Court recognized that water quality, under the Clean Water Act should be broadly construed:

> "In many cases, water quantity is closely related to water quality; a sufficient lowering of water quantity in a body of water could destroy all of its designated uses, be it for drinking water, recreation, or . . . as a fishery. In any event, there is recognition in the Clean Water Act that reduced stream flow; *i.e*, diminishment of water quantity, can constitute pollution. This broad conception of pollution – one which expressly evinces Congress' concern with the physical and biological integrity of

[17] *Id.* at p. 22.

[18] 33 U.S.C. § 1362(19).

[19] Letter from LuJuana Wilcher, Assistant Administrator, United States Environmental Protection Agency to Hon. Lois Cashell, Secretary FERC (Jan. 18, 1991).

> water – refutes [the] assertion that the Act draws a sharp distinction between the regulation of water "quantity" and water "quality."[20]

10. State Board Policy for Implementation of Toxics Standards

The State Board Policy for Implementation of Toxics Standards (the SIP) provides that mixing zones shall not result in "objectionable bottom deposits."[21] This term is defined as "an accumulation of materials . . . on or near the bottom of a water body which creates conditions that adversely impact aquatic life, human health, beneficial uses, or aesthetics. These conditions include, but are not limited to, the accumulation of pollutants in the sediments . . . ."[22] There is no requirement that the adverse impact result from exposure to pollutants in the water column or sediment pore water. Consequently, if the harm resulted from direct contact with, or ingestion of, contaminated sediments, a discharge that resulted in this condition would violate the SIP. This recently adopted Policy reaffirms the Board's long-standing conclusion that its water quality jurisdiction extends beyond water column effects.

V.
REGIONAL BOARD DISCRETION IN SETTING CLEANUP LEVELS

Given these considerations, Resolution 92-49 should be interpreted to presumptively require cleanup of contaminated sediment to background sediment levels. However, the Resolution is flexible and allows a regional board to exercise substantial discretion in setting cleanup levels. Cleanup levels less stringent than background levels are permissible if cleaning up to those levels is technologically or economically infeasible – as long as the less stringent cleanup level is protective of beneficial uses. Beneficial uses must be protected not only from exposure to sediment-derived pollutants in the water column or sediment pore water, but also pollutants in, or on, the sediment particles that can adversely affect aquatic organisms and/or human health through bioaccumulation when such organisms ingest contaminated sediments or come in direct contact with such sediments.

Resolution 92-49 requires alternative cleanup levels less stringent than background to, among other factors, "be consistent with maximum benefit to the people of the state" and requires consideration of "all demands being made and to be made on the waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." This determination is made on a case-by-case basis and is based on considerations of reasonableness under the circumstances at the site. [23] Finally, the State

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[20] *PUD No. 1* v. *Washington Department of Ecology* (1994) 511 U.S. 700, 719.

[21] SIP at p. 15.

[22] *Id.* at Appendix 1-4.

[23] See SWRCB Order No. WQ 92-09.

Board has indicated that Resolution 92-49 does not require immediate compliance with cleanup goals.[24] Rather, the Resolution provides that a regional board must approve any cleanup proposal that the regional board finds will "have a substantial likelihood to achieve compliance, within a reasonable time frame, with cleanup goals."[25] In the context of underground tank cleanups, the State Board has concluded that "a reasonable time" may be decades where natural attenuation is the proposed cleanup approach.[26]

Although each cleanup project must be evaluated by a regional board on a case-by-case basis, the State Board, in Order WQ 92-09, recognized the infeasibility of dredging to background sediment concentrations at the Paco Terminals site in San Diego Bay. Key considerations included the cost of attaining a background sediment cleanup goal and the expected harm to beneficial uses that would result from the large-scale dredging that would be necessary to achieve background sediment levels.[27] Such harm may be expected due to physical disturbance of habitat and re-suspension of pollutants into the water column. More recently, in its response to comments on the Hot Spots Plan, the State Board indicated that regional boards would have significant discretion in determining when a site was adequately remediated. A commenter wanted to know if background levels would be required or some higher level. The State Board response noted that either of those levels could be selected by a regional board at its discretion.[28]

VI.
CONCLUSION

Regional boards must apply Resolution 92-49 when setting cleanup levels for contaminated sediments if such sediments threaten beneficial uses of the waters of the state, and the contamination or pollution is the result of a discharge of waste. Contaminated sediments must be cleaned up to levels consistent with background sediment quality unless it would be technologically or economically infeasible to do so. Any such alternative cleanup level may not unreasonably affect beneficial uses and must comply with all applicable Water Quality Control Plans and Policies. In setting alternative cleanup levels, regional boards must balance various factors. Resolution 92-49 allows for consideration of adverse impacts of cleanup as well as natural attenuation if cleanup goals can be met in a reasonable time.

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[24] SWRCB Order No. WQ-98-08-UST.

[25] Resolution 92-49, Section III.A

[26] See Note 25 at p. 12.

[27] See Note 15 at p. 4.

[28] Functional Equivalent Document for the Consolidated Toxic Hot Spots Cleanup Plan, p. 353.

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